Proceedings of 6th Electronics Packaging Technology Conference, 2004, pages 615-619

Flow analysis for flip chip underfilling process using characteristic based split method

Abstract

In this paper, an effort has made to analyze and numerically simulate the fluid flow in chip cavity using characteristic based split (CBS) method. Simulation methodology includes a solver for the fluid flow equations coupled with technique to keep track of the flow front. Solver uses general convection-diffusion equations and solves flow equations using CBS method in conjunction with finite element method (FEM). The fluid front tracking is carried out using Volume of Fluid (VOF) technique. The velocity field obtained from CBS scheme is used in pseudo-concentration approach to track the advancement of fluid front. A particular value of the pseudo-concentration variable is chosen to represent the free fluid surface demarcating the mold compound and air regions which can be tracked for each time step. Simulation has been carried out for a particular geometry of a flip- chip package. The results obtained are in good agreement with literature and experimental data.

Keywords — Characteristic based split (CBS), fluid flow equation, onvection-diffusion equation, Volume of fluid (VoF), flip chip devices